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Old World Pilophorini: Descriptions of Nine New Species with Additional Synonymic and Taxonomic Changes (Heteroptera: Miridae: Phylinae)

RANDALL T. SCHUH[1]

ABSTRACT

Nine new species are described in the genera *Sthenaridea* Reuter, *Aloea* Linnavuori, *Hypseloecus* Reuter, *Neoambonea* Schuh, and *Pilophorus* Hahn; illustrations of the male genitalia and other structures are provided. New distributional data are presented for two species previously described from Africa. *Demoplesia lutheri* Poppius is synonymized with *Sthenaridea piceoniger* (Motschulsky), *Demoplesia* Poppius becoming a junior synonym of *Sthenaridea* Reuter; *Sthenarus basalis* Poppius, a junior primary homonym of *Sthenarus basalis* Reuter (= *Rhinacloa* Reuter), is synonymized with *Sthenaridea australis* (Schuh); *Orthotylus plebejus* Poppius is synonymized with *Sthenaridea suturalis* (Reuter). *Wauella* Carvalho is treated as a junior synonym of *Hypseloecus* Reuter; *Pherolepis* Kulik is treated as a valid genus; and, *Bilirania* Carvalho, *Bilirandoides* Schuh, and *Strictotergum* Zou are treated as junior synonyms of *Pilophorus* Hahn. *Druthmarus congolensis* Carvalho and *D. tibialis* Linnavuori are treated as species incertae sedis in the Orthotylini; the placement of *Pilophorus minutissimus* Linnavuori is discussed and considered uncertain.

INTRODUCTION

This paper presents morphological and distributional information for nine previously undescribed species of Pilophorini from the Old World. New combinations, synonymies, and distributional data are indicated for some previously described taxa. The results contained herein will be used in conjunction with data from other sources in a phylogenetic analysis and generic classification of the Pilophorini (Schuh, 1989). Measurements for all species are presented in table 1.

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[1] Curator, Department of Entomology, American Museum of Natural History.

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TABLE 1
Five Measurements of Nine Pilophorine Species

	N	Apex tylus-cuneal fracture	Width head	Interocular space	Width pronotum	Length antennal segment 2
Sthenaridea liberiensis	♂	1.51	0.57	0.33	0.80	–
	♀	1.69	0.61	0.36	0.87	–
Aloea nairobi	2	1.73–1.86	0.81–0.82	0.42–0.43	0.98	0.78–0.82
Hypseloecus deemingi	3	1.93–1.99	1.07–1.09	0.64–0.66	1.27–1.29	0.73–0.76
Neoambonea samaru	3	1.86–1.89	0.93–0.98	0.48–0.49	1.15–1.17	0.75–0.80
Neoambonea yotvata	3	1.62–1.72	0.84–0.86	0.43–0.46	0.98–1.04	0.61–0.65
Pilophorus arboreus	3	1.86–1.97	0.71–0.72	0.42	0.79–0.80	0.72–0.76
Pilophorus lestoni	2	2.20	0.91–0.92	0.42–0.43	1.02–1.03	0.90
Pilophorus linnavuorii	3	2.17–2.19	0.97–1.03	0.48–0.54	1.08–1.14	0.96–0.99
Pilophorus prolixus	♂	2.70	0.78	0.20	0.70	1.06
	♀	3.11	0.74	0.27	0.81	1.05

ACKNOWLEDGMENTS

I thank John Deeming, formerly of the Institute for Agricultural Research, Samaru, Zaria, Nigeria, for the gift of specimens from Nigeria. J. C. M. Carvalho, Rio de Janeiro (JCMC), William R. Dolling, British Museum (Natural History), London (BM[NH]), Thomas J. Henry, USDA Systematic Entomology Laboratory, c/o National Museum of Natural History, Washington D. C. (USNM), Antti Jansson, University Zoological Museum, Helsinki (HM), Leonard Kelton and Robert Footitt, Biosystematics Research Centre, Agriculture Canada, Ottawa (CNC), I. M. Kerzhner, Zoological Institute, Leningrad, Rauno Linnavuori, Raisio, Finland (Linnavuori), and Gordon Nishida, Bishop Museum, Honolulu (BISH), generously made available material in their care. Other specimens came from the collections of the American Museum of Natural History (AMNH). T. J. Henry, M. D. Schwartz, and G. M. Stonedahl kindly reviewed the manuscript and provided numerous helpful suggestions.

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Sthenaridea Reuter

Sthenaridea Reuter, 1884: 197 (n. gen.). – Schuh and Schwartz, 1988: 184 (diag., syns.).

Demoplesia Poppius, 1913: 249. (n. gen.). NEW SYNONYMY.

DISCUSSION: Examination of the holotype male of *Demoplesia lutheri* Poppius, 1913 (HM) (which Schuh, 1984: 6, recorded as a *nomen dubium*), indicates that it is conspecific with *Sthenaridea piceoniger* (Motschulsky) **New Synonymy**. Thus, the monotypic *Demoplesia* is added to the long list of generic synonyms of *Sthenaridea* (see Schuh and Schwartz, 1988, for a complete synonymy).

Examination of the holotype male of *Sthenarus basalis* Poppius, 1914, deposited in the Helsinki Museum, indicates that it is a synonym of *Sthenaridea australis* (Schuh) **New Synonymy**, previously known only from southern Africa. *Sthenarus basalis* Poppius is also a junior primary homonym of *Sthenarus basalis* Reuter (= *Rhinacloa basalis*; see Schuh and Schwartz, 1985: 395). According to article 60b of the Code of Zoological Nomenclature, *australis* become the valid name for the taxon.

Examination of the holotype female of *Orthotylus plebejus* Poppius, 1914, indicates that it is a junior synonym of *Sthenaridea suturalis* (Reuter) **New Synonymy** and a junior secondary homonym of *Sthenarus plebejus* Reuter, 1907.

Sthenaridea liberiensis, new species

Figures 1a–c

HOLOTYPE: Male, LIBERIA, 1955, RobtsFld, ix, NLH Krauss; deposited in USNM.

DIAGNOSIS: Recognized by the mostly castaneous coloration of the body, the pale trochanters, and the form of the male genitalia

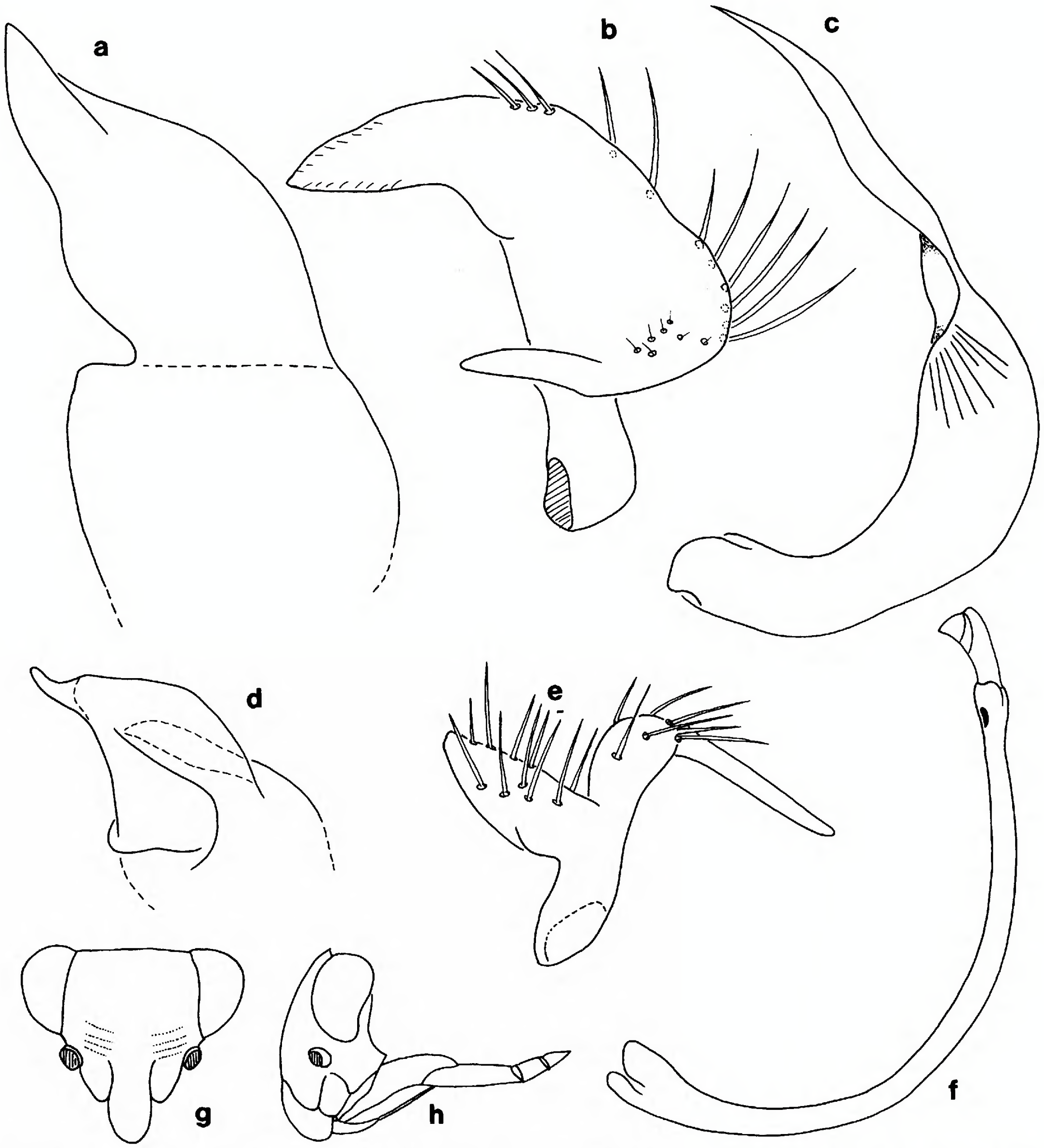

Fig. 1. a–c. *Sthenaridea liberiensis*. **a.** Phallotheca. **b.** Left paramere. **c.** Vesica. d–h. *Aloea nairobi*. **d.** Phallotheca. **e.** Left paramere. **f.** Vesica. **g.** Frontal view of head. **h.** Lateral view of head and labium.

with the proximal half of the vesica strongly inflated (fig. 1c).

DESCRIPTION: Small species, length apex tylus–cuneal fracture 1.51 mm. COLORATION: Body mostly castaneous, trochanters pale and contrasting with remainder of body and appendages. SURFACE AND VESTITURE: Dorsum and abdominal venter smooth, polished, and weakly shining, covered with relatively long, decumbent, pale, simple setae, and some scalelike sericeous setae on hemelytra (both known specimens rubbed). STRUCTURE: Head declivent and only moderately projecting in front of eyes; lateral corial margins very weakly convex, body nearly straight-sided, weakly ovoid. MALE GENITALIA: Vesica enlarged and broad on proximal one-half, apical half attenuated, secondary gonopore obsolete (fig. 1c); phallotheca more or less erect (fig. 1a);

left paramere of conventional form, posterior process somewhat elevated but not strongly flattened or elongated (fig. 1b).

ETYMOLOGY: Named for its occurrence in Liberia.

HOST: Unknown.

DISTRIBUTION: Liberia.

PARATYPE: Same data as holotype, 1♀ (USNM).

Aloea nairobi, new species

Figures 1d–h

HOLOTYPE: Male, [Kenya], Nairobi, 14/2/54, ANB 172; deposited in BM(NH).

DIAGNOSIS: As in other *Aleoa* species with the head distinctly projecting anteriorly and the calli protuberant; similar to *nigritula* Linnavuori in the dark reddish coloration of the body, but distinguished by all coxae being pale except at the base and the completely pale pro- and mesofemora and labium.

DESCRIPTION: Moderately large, more or less ovoid species, length apex tylus–cuneal fracture 1.86 mm. COLORATION: Body, proximal one-third of antennal segment 1, extreme proximal portion of all coxae, and nearly entire metafemur blood red to nearly maroon; remainder of appendages, including labium, pale yellow white; membrane largely infuscate with pale triangular areas at apex of cuneus. SURFACE AND VESTITURE: Entire surface of dorsum conspicuously granular and dull; dorsum with scattered but numerous long, nearly erect, curving, golden common setae; silvery scalelike setae typical of Pilophorini generally distributed for the most part in small patches; entire thoracic pleuron with scattered scalelike setae; abdominal venter with reclining, golden, common setae and numerous small patches of scalelike setae. STRUCTURE: Head projecting anteriorly, face elongate, distance below eyes equal to nearly 1.5 times height of eye (figs. 1g, h); posterior margin of vertex carinate, erect, and nearly straight across in dorsal and frontal views; buccal cavity very large and broadly ovoid in outline; labium not quite reaching posterior margin of mesotrochanters, segment 1 very long and robust, reaching to posterior margin of prosternal xyphus (well past anterior margin of procoxae), segment 2 elongate, segments 3 and 4 very short and stout (fig. 1h), combined length less than length of segment 2; antennal segment 1 long and slender, length slightly less than interocular distance, segments 2, 3, and 4 slender; pronotal calli widely separated and strongly elevated; mound shaped; pronotum with lateral margins concave, posterior angles projecting posterolaterally, posterior margin deeply incised mesially and broadly convexly rounded on either side of midline; mesoscutum moderately exposed, scutellum weakly swollen and elevated; lateral corial margins weakly convex, most strongly rounded just anterior to shallow cuneal incisure; femora elongate, slender, and nearly parallel-sided; tibiae cylindrical, slender, and straight. MALE GENITALIA: Vesica in form of untwisted simple tube without glassy spicules subtending secondary gonopore (fig. 1f); phallotheca as in figure 1d; left paramere elongate, strongly elevated, and deeply cleft as in other *Aloea* species (fig. 1e).

ETYMOLOGY: Named for the type locality; a noun in apposition.

HOSTS: Unknown.

DISTRIBUTION: Kenya.

PARATYPES: 1♂, 4♀, same data as holotype (AMNH, BM[NH]).

Hypseloecus Reuter

Hypseloecus Reuter, 1891: 49 (n. gen.). – Kerzhner, 1970: 636 (diag., syn., key to species). – Linnavuori, 1986: 148 (disc., syn.).

Ambonea Odhiambo, 1960: 393 (n. gen.). – Schuh, 1974: 201 (diag.). – Linnavuori, 1975: 59 (disc.).

Wauella Carvalho, 1987: 186 (n. gen.). NEW SYNONYMY.

DISCUSSION: Originally described to contain the single species *visci* (Puton), *Hypseloecus* long included only that species. Kerzhner (1970) synonymized *Pherolepis* Kulik with *Hypseloecus* and transferred *Pherolepis amplus* Kulik and *Neocoris aenescens* Reuter, both of which had been placed in *Pherolepis* by Kulik (1968); Kerzhner also described two new species *fasciatus* and *kiritshenko* in *Hypseloecus*.

In my judgment, none of the species placed in *Hypseloecus* by Kerzhner (1970) are congeneric with the type, although all four appear congeneric with one another, on the basis of two synapomorphies: highly polished pronotum and the absence of scalelike setae on the abdomen. Additionally, *Pherolepis* species are also distinguished from *Hypseloecus* by the the absence of scalelike setae on the head, pronotum, and propleuron, among other characters. I am therefore resurrecting *Pherolepis* Kulik to accommodate these four species.

Odhiambo (1960), in the discussion accompanying the original description, compared *Ambonea* to *Hypseloecus* and other genera, of what I consider to be a correctly construed Pilophorini. He indicated what he believed to be differences between the two. Linnavuori (1986) compared *Hypseloecus visci*, the type, with several African species described by him, and synonymized *Ambonea* with *Hypseloecus.* I concur with this action, and have confirmed it through comparison of specimens of *opima* (the type of *Ambonea*) and *maesta* Odhiambo. Thus, I am creating the following **new combinations** by moving all species previously placed in *Ambonea* to *Hypseloecus*, namely, *ifugao* (Schuh), 1984; *koroba* (Schuh), 1984; *maesta* (Odhiambo), 1960; *morobe* (Schuh), 1984; *munroi* (Schuh), 1974; *opima* (Odhiambo), 1960; *rustenbergensis* (Schuh), 1974; *tamaricis* (Linnavuori), 1975; *v-rubra* (Linnavuori), 1975.

Examined paratypes of *Wauella squamata* Carvalho, 1987 (BISH, JCMC), have all of the attributes of *Hypseloecus* species, and I am therefore treating *Wauella* Carvalho as a junior synonym. Contrary to the habitus illustration published by Carvalho (1987) my observations suggest that the scalelike setae on the dorsum are actually rather uniformly distributed and not aggregated in patches as his figure would suggest.

Hypseloecus maesta (Odhiambo), new combination

Ambonea maesta Odhiambo, 1960: 397 (n. sp.).

DISCUSSION: This species was adequately described and illustrated by Odhiambo (1960). The following new locality records have come to light since Odhiambo's original description.

DISTRIBUTION: Ghana; Nigeria; Uganda.

Specimens Examined: GHANA: Tafo, UV trap, 26.VI.65, 6.VIII.65, 15.VIII.65, 17.XI.65,. 24.XII.65, 5.I.66, 12.I.66, 19.I.66, 23.I.66, 1.II.66, 3.II.66, 27.II.66, 27.IV.66 (Leston; AMNH, BM[NH]), 17♂, 1♀; Tafo, IX.X.1967 (E. O. Boafo; CNC), 1♀; Obuasi, 7.II.66, UV trap (Leston, BM[NH]), 1♀; Prestea, 12.II.66, UV trap (Leston, BM[NH]), 1♀; Sunyani, 12.XII.65 (Leston, BM[NH]), 1♀. NIGERIA: **Northern Central State**: Zaria, Samaru, 6.ix.1975, 2.xi.1975 (Deeming; AMNH), 2♂. **Western State**: Ibadan, 15–19.xii.1975 (Deeming; AMNH), 1♀; Ibadan, May 62 (D. C. Eidt; CNC), 1♂; Ife, 7008.VII–12.VIII.75 (Linnavuori; AMNH), 2♂; Ile-ife, 15 July 1976 (J. T. Medler; AMNH), 1♂.

Hypseloecus deemingi, new species

Figures 2a–c

HOLOTYPE: Male, N. NIGERIA: Zaria, Samaru, 22,xi.1975, J. C. Deeming; deposited in AMNH.

DIAGNOSIS: Similar in appearance among African species to *maesta*, *opima*, and *munroi*; distinguished by the short stocky body, very broad head, and the form of the male genitalia, the vesica in the form of a sclerotized tube, the secondary gonopore subtended proximally by a field of glassy spicules, and the apex of the vesica with a sclerotized extension surrounded by membranous lobes (fig. 2c).

DESCRIPTION: Moderate size, subquadrate species, length apex tylus–cuneal fracture 1.99 mm. COLORATION: Generally reddish or reddish brown, with white as follows: procoxae, extreme bases of meso- and metacoxae, metathoracic scent gland evaporatory area, bucculae, prosternal xyphus, partial or complete stripe on dorsal surface of all tibiae, and all tarsal segments 1 and 2; all tarsal segments 3 infuscate. SURFACE AND VESTITURE: Body surface smooth, very weakly shining; dorsal margin of mesepisternum and anterobasal area of metepisternum each with dark velvety patch; dorsum and frons covered with reclining, brown, common setae and appressed, scalelike, sericeous setae; thoracic pleura and abdominal venter covered with regularly spaced patches of a few appressed, scalelike, sericeous setae; abdominal venter, including genital capsule, also with reclining fine common setae; antennal segment 1 with a few erect dark spines on inner surface, remaining segments with short, neat, recumbent vestiture, tibiae with some reclining black spines slightly longer than tibial diameter. STRUCTURE: Head strongly transverse and very broad as viewed from above, nearly as broad as pronotum, posterior margin conforming closely to contour of anterior pronotal margin; posterior margin of vertex vertical, carinate, weakly excavated in dorsal view; eyes occupying about two-thirds of height of head in lateral view; antennae inserted at about level of ventral margin of eyes, mesial margin of eyes straight, antennal fossae removed from inner margins of eye by distance about equal to diameter of fossa; antennal segment 1 short and stout, length less than one-third of width of vertex, length of segment 2 slightly greater than width of vertex, somewhat enlarged and nearly cylindrical, segments 3 and 4 together slightly longer than segment 2, subequal in diameter, diameter less than that of segment 2; bucculae narrow, buccal cavity round, gula obsolete; labium elongate, slender, and tapering to apex, reaching to anterior margin of metatrochanters, segment 1 reaching to posterior margin of prosternal xyphus; pronotum short and broad, gently rounded transversely and longitudinally, lateral margins distinctly convex, an erect fine spine near anterolateral angle, calli not demarcated, humeral angles broadly rounded, posterior margin very weakly excavated across mesoscutum; mesoscutum moderately broadly exposed; scutellum very weakly convex; hemelytra weakly declining laterally, costal margin weakly convex, and entirely visible from above; cuneus with incisure shallow, strongly declivent; pro- and mesofemora elongate rectangular, more or less parallel-sided, metafemora somewhat enlarged with straight ventral surface and rounded dorsal surface; all tibiae cylindrical and slender, metatibiae slightly bent; abdomen broad basally and broadly attached to thorax. MALE GENITALIA: Vesica in form of flat, sclerotized tube, secondary gonopore subtended proximally by field of glassy spicules and apically with sclerotized process surrounded by membranous lobes (fig. 2c); phallotheca as in figure 2a; left paramere as in figure 2b.

ETYMOLOGY: Named for John C. Deeming, collector of the holotype and other specimens valuable to this study.

HOSTS: Unknown.

DISTRIBUTION: Chad; northern Nigeria.

PARATYPES: Same data as holotype, except 16.iii.1974, 13.xi.1975, 6.xii.1975, 27.i.1976, 5.ii.1976, 9.ii.1976, 15.ii.1976, 16.ii.1976, 18.ii.1976 (AMNH), 10♂, 15♀. CHAD: Bebedja, 28–31.V.73, Linnavuori (AMNH, Linnavuori), 6♂, 5♀; Farcha, 20–22.V.73, Linnavuori (Linnavuori), 1♀. NIGERIA: **Kwara State:** Kishi Kaiama, 20.VII.73, Linnavuori (Linnavuori), 2♂, 1♀. **North Eastern State:** Serti, March 29, 1970, J. T. Medler (Linnavuori), 1♀.

Neoambonea Schuh

Neoambonea Schuh, 1974: 204 (n. gen.). – Linnavuori, 1986: 150 (disc.).

DISCUSSION: Linnavuori (1986) transferred *Ambonea uniformis* Linnavuori to *Neoambonea* on the basis of the inflated scutellum, coloration of the coxae and scent gland orifices, the deep cuneal fracture, and the shape of the left paramere (deeply cleft); he also described the species *scutellaris* as new from Saudi Arabia. I have assigned two new species—*samaru* and *yotvata*—to *Neoambonea* as well as transferring *russeola* (Linnavuori), 1975, **new combination**, which was placed in *Hypseloecus* Reuter by Linnavuori (1986). These three species are all reddish rather than black and lack the bulbous scutellum found in *uniformis* and *scutellaris.* They do, however, have a distinctly punctured dorsum. Linnavuori (1975, 1986) apparently did not have sufficient material available to compare genitalic differences between species he placed in *Hypseloecus* and *Neoambonea.* The left paramere and vesica of *samaru* and *yotvata* are very similar, both being much more similar to other *Neoambonea* species than to any *Hypseloecus* species. The punctation of the dorsum and the vesical structure with one or two "wings" seems to be synapomorphous for *Neoambonea.*

Neoambonea uniformis (Linnavuori)

Ambonea uniformis Linnavuori, 1975: 61 (n. sp.).
Neoambonea uniformis Linnavuori, 1986: 150 (disc.).

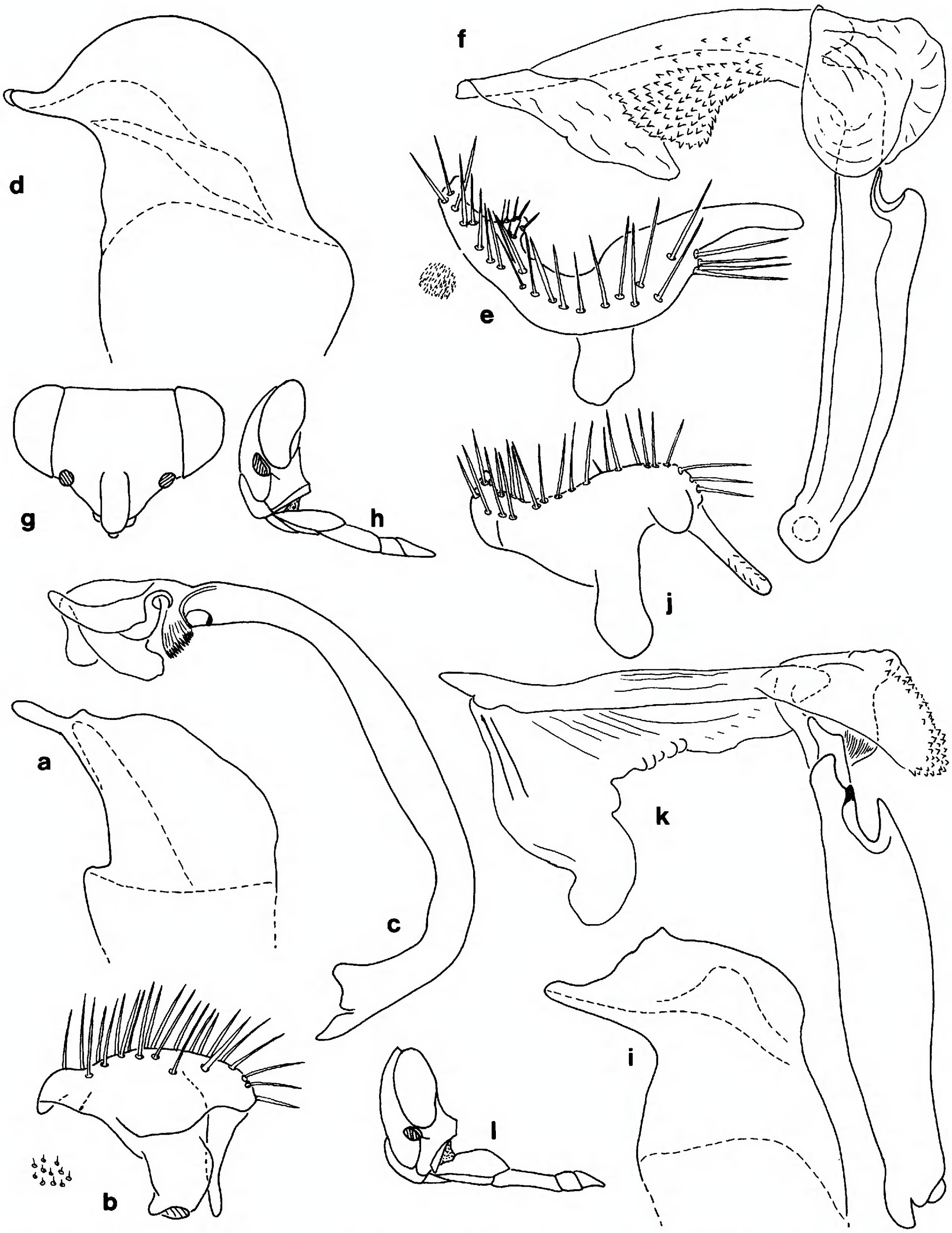

Fig. 2. a–c. *Hypseloecus deemingi*. **a.** Phallotheca. **b.** Left paramere. **c.** Vesica. d–h. *Neoambonea samaru*. **d.** Phallotheca. **e.** Left paramere. **f.** Vesica. **g.** Frontal view of head. **h.** Lateral view of head and labium. i–l. *Neoambonea yotvata*. **i.** Phallotheca. **j.** Left paramere. **k.** Vesica. **l.** Lateral view of head and labium.

DISCUSSION: The following new distributional record has come to light since the publication of Linnavuori's original description.

DISTRIBUTION: Ethiopia; Kenya.

SPECIMENS EXAMINED: ♂, [Kenya]: Limurua, KC, April 1955, TL 1602 DCT (AMNH, BM[NH]), 4♂, 5♀.

DISCUSSION: The scutellum in the specimens examined from Kenya is slightly more inflated than in the type female; otherwise specimens from the two localities appear nearly identical.

Neoambonea samaru, new species

Figures 2d–h

HOLOTYPE: Male, N. NIGERIA: Zaria, Samaru, 22.xi.1975, J. C. Deeming; deposited in AMNH.

DIAGNOSIS: Similar in appearance and structure to *russeola* and *yotvata*, in the flattened body, the transversely rugulose surface of nearly the entire dorsum, and the largely reddish coloration. Recognized by the moderate size and the form of the male genitalia, which are most similar to *yotvata*.

DESCRIPTION: Moderate size quadrate species, length apex tylus–cuneal fracture 1.89 mm. COLORATION: General coloration brown with or reddish brown and yellow white markings; head mostly pale except clypeus, lora, and bucculae red brown; dorsum mostly brown with pale areas on anterior margin, midline, posterior margin, and pleuron of pronotum, anterior half of exocorium and endocorium anterolaterally, anterior margin of cuneal fracture, and apex of scutellum; membrane with a few areas weakly infuscate; pro- and metafemora broadly red brown mesially; legs otherwise, pronotal xyphus, labial segments 3 and 4, and metathoracic scent gland evaporatory area white. SURFACE AND VESTITURE: Upper body surface (except head), shallowly punctured and roughened, generally dull and at most very weakly shining; dorsal margin of mesepisternum and anterobasal area of metepisternum each with dark velvety patch; dorsum densely pubescent, frons with several transverse rows of golden, shining, scalelike setae, remainder of dorsum with decumbent golden common setae and dense covering of golden, shining, scalelike setae; prothoracic pleuron with scattered scalelike setae, meso- and metathoracic pleura with patches of scalelike sericeous setae, pregenital abdominal sternites with transverse rows of scalelike setae, genital capsule with few such setae; abdominal venter, including genital capsule, also with reclining fine common setae; antennal segment 1 with few erect pale spines on inner surface, remaining segments with short, neat, recumbent vestiture, tibiae with some reclining pale spines slightly longer than tibial diameter. STRUCTURE: Head transverse and broad as viewed from above, posterior margin conforming closely to contour of anterior pronotal margin; posterior margin of vertex vertical, carinate; eye occupying about two-thirds of height of head in lateral view; antenna inserted at about level of ventral margin of eye, mesial margin of eyes weakly emarginate, antennal fossa contiguous with inner margin of eye (fig. 2g); antennal segment 1 short, length slightly less than one-half of width of vertex, length of segment 2 about 1.5 times as long as width of vertex, somewhat enlarged and nearly cylindrical, segments 3 and 4 together slightly longer than segment 2, subequal in diameter, diameter less than that of segment 2; bucculae narrow, buccal cavity relatively small and round, gula obsolete; labium relatively short and stout, just surpassing posterior margin of mesosternum, segment 1 slightly surpassing posterior margin of prosternal xyphus, segment 2 relatively slender, segments 3 and 4 swollen, combined length about equal to length of segment 2 (fig. 2h); pronotum broad, gently rounded transversely and longitudinally, lateral margins distinctly convex, calli not demarcated, humeral angles broadly rounded, posterior margin broadly excavated across mesoscutum; mesoscutum moderately exposed; scutellum very weakly convex; hemelytra weakly declining laterally, costal margin distinctly convex, and entirely visible from above; cuneus strongly declivent, incisure shallow; all femora elongate rectangular; all tibiae cylindrical, slender, and straight; abdomen broad basally and broadly attached to thorax. MALE GENITALIA: Vesica with distinctive asymmetrical apical region with membranous spine-covered bag (fig. 2f), found otherwise only in *yotvata* (fig. 2k); phallotheca as in figure 2d; left paramere weakly cleft with an elongate flattened anterior process (fig. 2e).

ETYMOLOGY: Named for Samaru, the type locality; a noun in apposition.

HOSTS: Unknown.

DISTRIBUTION: Chad; northern Nigeria.

PARATYPES: Same data as holotype, but also 1.I.73, 22.iv.1974, 17.x.1975, 21.x.1975, 2.xi.1975, 13.xi.1975, 3.ii.1976, 18.ii.1976, (AMNH), 9♂, 10♀. CHAD: Bebedja, 28–31.V.73, Linnavuori (AMNH, Linnavuori), 1♂, 4♀; Farcha, 20–22.V.73, Linnavuori (Linnavuori), 1♂. NIGERIA: **Kwara State:** Kishi Kaiama, 20.VII.73, Linnavuori (Linnavuori), 15♂, 24♀. **North Central State:** Kagoro Forest, 29–30.VIII.73 (Linnavuori), 1♂.

Neoambonea yotvata, new species

Figures 2i–l

HOLOTYPE: Male, ISRAEL: S. Distr., Yotvata, 24.4.1986, R. Linnavuori; deposited in AMNH.

DIAGNOSIS: See diagnosis for *samaru.* Recognized by the small size, the elongate face, and the form of the male genitalia, which are most similar to those of *samaru.*

DESCRIPTION: Relatively small quadrate species, length apex tylus–cuneal fracture 1.72 mm. COLORATION: General coloration brown; midline of pronotum and exocorium usually lighter than surrounding areas; appendages generally pale to nearly white, except antennal segment 1 with some diffuse reddish markings, meso- and metacoxae brown on proximal half, metafemur with broad red brown band mesially; labial segments 3 and 4 pale. SURFACE AND VESTITURE: Upper body surface, except head, shallowly punctured and roughened, generally dull and at most very weakly shining; dorsal margin of mesepisternum and anterobasal area of metepisternum each with dark velvety patch; dorsum densely pubescent, frons with several transverse rows of golden, shining, scalelike setae, remainder of dorsum with decumbent golden common setae and dense covering of golden, shining, scalelike setae; prothoracic pleuron with scattered scalelike setae, meso- and metathoracic pleura with patches of scalelike sericeous setae, pregenital abdominal sternites with transverse rows of scalelike setae, genital capsule with few such setae; abdominal venter, including genital capsule, also with reclining fine common setae; antennal segment 1 with few erect pale spines on inner surface, remaining segments with short, neat, recumbent vestiture, tibiae with some reclining pale spines longer than tibial diameter. STRUCTURE: Head transverse and broad as viewed from above, but not as broad as in *samaru* and more strongly projecting anteriorly, posterior margin conforming closely to contour of anterior pronotal margin; posterior margin of vertex vertical, carinate, weakly excavated; eye occupying slightly more than one-half of height of head in lateral view; antenna inserted at about level of ventral margin of eye, mesial margin of eye weakly emarginate, antennal fossa contiguous with inner margin of eye; antennal segment 1 short, length slightly less than one-half of width of vertex, length of segment 2 slightly about 1.5 times as long as width of vertex, somewhat enlarged and nearly cylindrical, segments 3 and 4 together slightly longer than segment 2, subequal in diameter, diameter less than that of segment 2; bucculae narrow, buccal cavity round, gula very short; labium relatively short and stout, just surpassing posterior margin of mesotrochanters, segment 1 slightly surpassing posterior margin of prosternal xyphus, segment 2 relatively slender and about as long as segment 1, segments 3 and 4 swollen and of combined length about two-thirds that of segment 2 (fig. 2l); pronotum broad, gently rounded transversely and longitudinally, lateral margins nearly straight, calli not demarcated, humeral angles broadly rounded, posterior margin broadly excavated across mesoscutum; mesoscutum moderately exposed; scutellum weakly convex; hemelytra weakly declining laterally, costal margin distinctly convex, and entirely visible from above; cuneus with incisure shallow, strongly declivent; all femora elongate rectangular; all tibiae cylindrical, slender, and straight; abdomen broad basally and broadly attached to thorax. MALE GENITALIA: Vesica with distinctive asymmetrical apical region with spine-covered membranous bag (fig. 2k), found otherwise only in *samarus* (fig. 2f); phallotheca as in figure 2i; left paramere with an elongate flattened anterior process (fig. 2j).

ETYMOLOGY: Named for the type locality; a noun in apposition.

HOSTS: Unknown.

DISTRIBUTION: Chad; Israel.

PARATYPES: Same data as holotype

(AMNH, Linnavuori), 34♂, 29♀. CHAD: Babedja, 28–31.V.73, Linnavuori (Linnavuori), 1♀. ISRAEL: **S. Distr.:** 'En Yahav, 23.6.1986, R. Linnavuori (Linnavuori), 1♀.

Pilophorus Hahn

Pilophorus Hahn, 1826: 22 (n. gen.).
Bilirania Carvalho, 1956: 215 (n. gen.). – Schuh, 1974: 306 (disc.). NEW SYNONYMY.
Biliranoides Schuh, 1984: 27 (n. gen.). NEW SYNONYMY.
Strictotergum Zou, 1983: 283 (n. gen.). NEW SYNONYMY.

DISCUSSION: *Bilirania* Carvalho, *Biliranoides* Schuh, and *Strictotergum* Zou were all described on the basis of the mesially constricted or otherwise modified pronotum. My character analyses indicate that these structural modifications are simply autapomorphic for limited groups of species from South-East Asia, which otherwise possess all of the characters diagnostic for the genus *Pilophorus*. Although the species placed in these genera appear to belong to a single group, there is substantial variation in the form and degree of the constriction itself, and that variation is not strongly correlated with setal and genitalic characters important in the recognition of species groups within the genus *Pilophorus*. Furthermore, there is no evidence to suggest that *Pilophorus* species which do not have such novel pronotal shapes form a monophyletic group (see Schuh, 1989). I am therefore transferring all of the species previously placed in these three genera to *Pilophorus*, creating the following **new combinations**: *borneoensis* (Carvalho), 1986; *castaneus* (Zou), 1983; *culion* (Schuh), 1984; *kathleenae* (Schuh), 1984; *maculata* (Schuh), 1984; *myrmecoides* (Carvalho), 1956; *palawana* (Schuh), 1984; *pleiku* (Schuh), 1984; *sumatrana* (Schuh), 1984; *sundae* (Schuh), 1984.

Pilophorus arboreus, new species

Figures 3l–p

HOLOTYPE: Male, BRUNEI: Bukit Sulang nr. Lamunin, N. E. Stork, B. M. 1982-388, fogging, 20.viii-10.ix.82; insecticide fogging tree 16; Dipterocarp. *Shorea johorensis* Fox.; deposited in BM(NH).

DIAGNOSIS: Similar in appearance to *Pilophorus dailahn* Schuh, but with the hemelytra more strongly constricted mesially and with the polished areas more extensive; abdomen strongly constricted and stalklike basally.

DESCRIPTION: Moderate size, elongate species with hemelytra strongly constricted mesially, length apex tylus–cuneal fracture 1.86 mm. COLORATION: General coloration deep castaneous to nearly black; antennal segment 1, segment 2 mesially, frons, and profemora and tibiae somewhat lighter; extreme proximal portion of antennal segment 3 and all tarsal segments 1 and 2 white or nearly so. SURFACE AND VESTITURE: Body and legs generally smooth, very highly polished and shining; clavus, except anterolateral margin, and posterior half of endocorium finely punctured and with completely dull matte surface, in marked contrast to surrounding areas; polished body areas sparsely covered with reclining, shining simple setae; sericeous scalelike setae in form of patch apically on scutellum, an incomplete transverse band on corium at level of apex of scutellum, patch on endocorium at level of maximum constriction of hemelytra, patch on inner angle of cuneus, patch on dorsal margin of metepimeron, and on abdominal sternite 2; matte textured portion of clavus and corium with some golden, recumbent, woolly setae; head and scutellum with scattered, long, erect setae; antennal segment 1 with few erect pale setae, segment 2 with pale reclining setae, segments 3 and 4 with reclining and suberect pale fine setae; protibiae with reclining pale spines about as long as tibial diameter, mesofemora with darker spines, metafemora with longer, heavier, reclining, dark spines. STRUCTURE: Head short and broad as viewed from above, posterior margin of vertex and eyes nearly semicircular in outline and conforming closely to anterior margin of pronotum; vertex and frons nearly vertical, posterior margin of vertex finely carinate; height of head below eyes slightly more than half the height of eye; face below eyes more or less broadly rounded, lora and genae weakly bulging in frontal view; bucculae moderately broad and closing buccal cavity posteriorly, buccal cavity nearly round and directed ventrally; gula vertical, about as long as diameter of antennal segment 1; labium reaching to about posterior margin of mesosternum, segment 1 just reaching posterior margin of buccal cavity (fig. 3p), remaining segments slender and tapering to apex; antennae inserted slightly above ventral margin of eye, fossa removed from eye by distance equal to about one-half diameter of fossa, mesial margin of eye weakly emarginate (fig. 3o); antennal segment 1 relatively slender, length slightly greater than one-third width of vertex, segment 2 weakly clavate, segments 3 and 4 very slender, subequal in diameter and length, combined length about equal to length of segment 2; pronotum subtumidiform with no demarcation of anterior and posterior lobes, lateral margins nearly straight and parallel on anterior half, posterior half flaring out to form a narrow, flattened shoulder, posterior margin weakly but evenly convex across mesoscutum; mesoscutum steeply declining posteriorly and laterally with no distinct separation from scutellum; scutellum flattened posteriorly; hemelytra strongly constricted at about midpoint of claval commissure and broadest anterior to cuneal fracture, costal margin of posterior third of corium very broadly rounded, outline of hemelytra closely conforming to shape of abdomen; entire exocorium reflexed ventrally and obscured in dorsal view; cuneal fracture rather sharply angled anteromesially, cuneal incisure distinct, cuneus weakly rounded laterally; abdomen very strongly constricted basally, first two segments narrow and parallel-sided, remaining segments broadening and giving abdomen a more or less bulbous posterior half; profemora tapering distally, meso- and metafemora nearly tubular, metafemora distinctly swollen on distal third; pro- and mesotibiae more or less cylindrical and straight, metatibia distinctly flattened, broadest at about midpoint, gently but distinctly curving. MALE GENITALIA: Vesica flat and more or less tubular with small, simple, mesial spine, secondary gonopore subtended distally by small field of glassy spicules, apex membranous (fig. 3n); phallotheca as in figure 3l; left paramere as in figure 3m.

ETYMOLOGY: From the Latin *arboreus*, for its habit of living in trees.

HOSTS: *Shorea johorensis* (Dipterocarpaceae).

DISTRIBUTION: Northern Borneo.

PARATYPES: Same data as holotype (AMNH, BM[NH]), 5♂, 8♀.

DISCUSSION: A second species very similar to *arboreus*, but slightly smaller, also exists in the collections of the British Museum. It is represented by one teneral male and two females collected with *arboreus* and by a another possibly conspecific male from Kuala Lumpur, Malaya.

Pilophorus lestoni, new species

Figure 3a–f

HOLOTYPE: Male, Tafo, GHANA, 10.IX.67, D. Leston, UV trap; deposited in BM(NH).

DIAGNOSIS: Distinguished by its moderately elongate body form, the complete, broad, band of scalelike setae anteriorly on the hemelytra, the apparent absence of aggregations of scalelike setae on the thoracic pleura, nearly round and strongly posteriorly directed buccal cavity, the inflated labial segments 3 and 4, uniquely by the greatly enlarged and flattened (at least in available specimens) first antennal segment, and the form of the male genitalia, with an elongate asymmetrical sclerotized process apically and a small field of glassy spicules subtending the secondary gonopore; similar in general appearance to *linnavuorii*.

DESCRIPTION: Moderately elongate species, length apex tylus–cuneal fracture 2.20 mm. COLORATION: Body and appendages usually castaneous to nearly black; extreme proximal portion of antennal segment 2 yellow white, segment 3 light proximally; entire membrane infuscate. SURFACE AND VESTITURE: Most of dorsum distinctly granulose, except posterior lobe of pronotum polished and smooth; head, anterior lobe of pronotum, mesoscutum, and scutellum weakly shining, posterior lobe of pronotum somewhat more strongly polished; hemelytra dull; dorsum at least (both available specimens rather badly rubbed) with some reclining, dull, common setae and broad band of scalelike, silvery, shining, setae at level of apex of scutellum reaching across entire width of hemelytra and at least some scalelike setae (possibly in form of band located at level of about midpoint of claval commissure; tho-

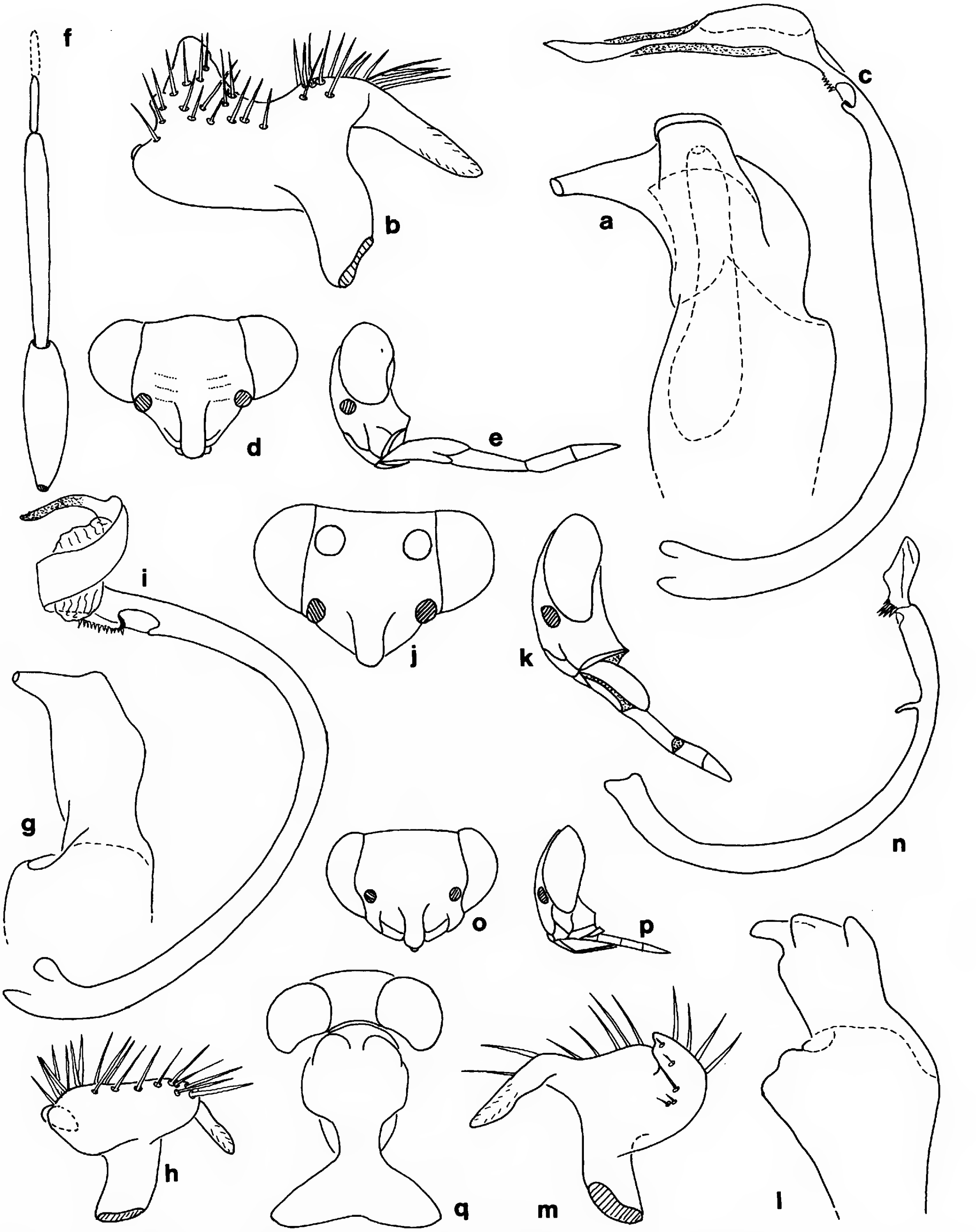

Fig. 3. a–f. *Pilophorus lestoni*. **a.** Phallotheca. **b.** Left paramere. **c.** Vesica. **d.** Frontal view of head. **e.** Lateral view of head and labium. **f.** Antenna. g–k. *Pilophorus linnavuorii*. **g.** Phallotheca. **h.** Left paramere. **i.** Vesica. **j.** Frontal view of head. **k.** Lateral view of head and labium. l–p. *Pilophorus arboreus*. **l.** Phallotheca. **m.** Left paramere. **n.** Vesica. **o.** Frontal view of head. **p.** Lateral view of head and labium. **q.** *Pilophorus prolixus*, dorsal view of head and pronotum.

racic pleuron with scattered scalelike setae; abdominal venter with few scattered scalelike setae. STRUCTURE: Head nearly erect, elongate below eyes, in frontal view strongly converging toward apex of tylus, genae nearly straight, height of head below eye somewhat less that height of an eye, genae broad and nearly flat, buccal cavity relatively small, nearly round, gula distinct but short; labium reaching to anterior margin of metatrochanters, segment 1 very long and stout, slightly surpassing posterior margin of prosternal xyphus, segment 2 nearly as long as segment 1, segments 3 and 4 relatively short, combined length about equal to that of segment 2 (fig. 3e); antennal segment 1 very long, about as long as interocular space plus one eye, greatly enlarged, flattened (at least in dried specimens) and foliaceous in appearance, approximate ratio of width to length 1 : 3; antennal segment 2 somewhat enlarged and of nearly uniform diameter, segment 3 very slender (segment 4 missing in available specimens) (fig. 3f); posterior margin of vertex nearly vertical, acuminate mesially, and rounded near eyes; granulose frons with transverse polished striae; posterior margin of head not closely conforming to pronotum, eyes projecting laterally; pronotum with calli indistinct, lateral margins weakly concave, posterior lobe moderately elevated and swollen, posterior margin weakly incised mesially and broadly rounded laterally; mesoscutum only moderately exposed, scutellum simple and nearly flat; hemelytra moderately to strongly rounded transversely, corial margin obscured in dorsal view and distinctly although not strongly sinuous; cuneal incisure deep, cuneus broadly rounded laterally and strongly declivent; abdomen broadly joined to thorax and not narrowed basally; femora relatively slender and nearly parallel-sided; tibiae very weakly flattened and slightly curved. MALE GENITALIA: Vesica flat and tubular, secondary gonopore subtended by small field of glassy spicules, apex in form of long, sclerotized, asymmetrical process (fig. 3c); phallotheca as in figure 3a; left paramere as in figure 3b.

ETYMOLOGY: Named for the late Dennis Leston, whose irrepressible energy and devotion to entomology did so much to further knowledge of the Heteroptera, and who is just about the only person ever to have done any systematic collecting of true bugs in Ghana.

HOSTS: Unknown.

DISTRIBUTION: Ghana.

PARATYPE: ♂, same data as holotype, except 22.XI.67 (AMNH). GHANA: Adeiso, 17.VI.70 (Leston; BM[NH]), 1♀.

Pilophorus linnavuorii, new species

Figures 3g–k

HOLOTYPE: Male, Nigeria, W[estern]. St., Ife, 7–8.VII., 14.VIII.73, Linnavuori; deposited in AMNH.

DIAGNOSIS: Recognized by the black coloration, hemelytra with four patches of scalelike setae, the relatively short labium with weakly inflated segments 3 and 4, the weakly *Pilophorus*-like body form, and the form of the male genitalia, with a "coiled" sclerotized apical process and a field of glassy spicules subtending the secondary gonopore; similar in general appearance to *lestoni*, but lacking the greatly elongated and flattened first antennal segment.

DESCRIPTION: Moderate size, length apex tylus–cuneal fracture 2.19 mm. COLORATION: Generally castaneous to nearly black; remainder yellow white as follows: antennal segment 1, proximal two-thirds of segment 2, segment 3 (segment 4 missing in holotype, infuscate in most specimens), labial segments 2–4 (except apex of last), procoxae, pro- and mesotibiae, and all tarsal segments 1 and 2, and large spot adjacent to mesial margin of eye (fig. 3j). SURFACE AND VESTITURE: Head, pronotum, and scutellum weakly rugulose, polished, and weakly shining; hemelytra granulose and dull; body generally covered with short, recumbent, golden common setae; scutellum and hemelytra rather densely covered with weakly flattened, recumbent, golden shining setae; scalelike sericeous setae in large patches laterally on mesoscutum (barely reaching onto scutellum), at extreme base of corium, in small patch near mesial margin of clavus at about midpoint of scutellum, in an elongate patch on corium at level of apex of scutellum, in small patch on clavus at level of about midpoint of claval commissure, in two patches on corium at level of about posterior two-thirds of claval commissure, as small patch at anteromesial corner of cuneus, scattered on propleuron, in 3 patches on mesopleuron, in small patch on posterior margin of metepisternum, and in transverse bands on all pregenital abdominal sternites. STRUCTURE: Posteriorly concave head closely conforming to anterior margin of pronotum in dorsal and lateral views, tylus strongly arched and curving posteroventrally; posterior margin of vertex carinate and nearly erect; antennal segment 1 of moderate length, slender, segment 2 only very slightly enlarged and of diameter only slightly greater than that of segments 3 and 4 (4 missing in holotype); genae very broadly rounded; gula very short; buccal cavity small, nearly round in outline; labium relatively stout, reaching to about posterior margin of mesotrochanters, segment 1 long and stout, reaching to at least posterior margin of prosternal xyphus, segment 2 more slender and of length about equal to that of segment 1, segments 3 and 4 short and stout, of combined length about equal to that of segment 2 (fig. 3k); pronotum with calli obsolete, posterior lobe smoothly rounded but only moderately elevated, lateral margins very broadly and convexly rounded, posterior margin sinuous, concave across mesoscutum; mesoscutum moderately exposed and elevated; scutellum nearly flat; hemelytra transversely rounded and declivent laterally, costal margin barely visible from above; cuneus with deep incisure, broadly rounded laterally, and strongly declivent; all tibiae straight, metatibiae of slightly greater diameter proximally than distally; abdomen broad basally and broadly attached to thorax. MALE GENITALIA: Vesica flat and tubular, secondary gonopore subtended by field of glassy spicules, apex elongate, sclerotized, and in form of a "coil" with a membrane attached (fig. 3i); phallotheca as in figure 3g; left paramere simple, as in figure 3h.

ETYMOLOGY: Named for Rauno Linnavuori, collector of many of the known specimens, and contributor of much of our knowledge of the Heteroptera fauna of North and West Africa.

HOSTS: Unknown.

DISTRIBUTION: Ghana; western Nigeria.

PARATYPES: 6♂, 9♀, same data as holotype (AMNH, Linnavuori). GHANA: Tafo, Adeiso, 12.VI.70, D. Leston, pyrethrum knockdown C3/7, 1♂; Tafo, 31.III.66, 1.IV.66, Leston, Pyrethrum knockdown, cocoa, 1♂, 4♀; Tafo, 29.X.65, 11.I.66, 23.I.66, 9.II.66, 12.IV.66, 25.3.67, 3.6.67, Leston, UV trap, 2♂, 5♀ (all BM[NH]).

Pilophorus prolixus, new species

Figures 3q

HOLOTYPE: Male, PHILIPPINE ISLANDS: Leyte: Dagami, 14 Mi. SW of Tacloban, July 21, 1961, P. I. Nat. Mus. & ANMH Expedition; deposited in AMNH.

DIAGNOSIS: Similar in structure to *myrmecoides* Carvalho, but distinguished by the much lighter generally pale brown coloration, the pale, long, erect setae on the head, the more elongate mesial constriction of the pronotum, and the conspicuous patches of scalelike setae laterally on the scutellum and anteromesially on the cuneus.

DESCRIPTION: Moderate size, elongate, length apex tylus–cuneal fracture 2.70 mm. COLORATION: General coloration pale golden brown; antennal segments 2 and 3 distally, and segment 4 entirely infuscate; all tibiae with constrasting castaneous stripe on dorsal surface; corium posterior to posterior band of scalelike setae very dark brown; nearly entire membrane infuscate; posteriorly broadened portion of abdomen infuscate. SURFACE AND VESTITURE: Most of body surface smooth, polished, and weakly to rather strongly shining, including hemelytra posterior to posterior band of scalelike setae; hemelytra anterior to posterior band of scalelike setae very finely granulose and dull; head and pronotum with only a few very long, nearly erect, golden, common setae; entire dorsum also with shorter, decumbent, golden, common setae; hemelytra anterior to posterior band of scalelike setae with scattered, subappressed, slightly flattened, small, golden, shining setae; scalelike silvery appressed setae in patches anterolaterally on scutellum, in band on exocorium at level of apex of scutellum, in complete band somewhat anterior to apex of clavus, in form of distinct patch on mesepimeron and tiny patch on metepisternum, and as an elongate patch on either side of midline of abdominal sternites 3–5 (taken from female paratype). STRUCTURE: Similar in most features to diagnosis provided by Schuh (1984) for *Bilirania* (= *Pilophorus*) but posterior margin of vertex distinctly incised mesially and rounded, lora weakly elevated and broadly rounded, gula moderately long, pronotum strongly constricted mesially and forming very long neck (more elongate than even *P. myrmecoides* (Carvalho) (fig. 3q), hemelytra conspicuously rounded transversely with lateral margins strongly sinuous in outline, metatibiae weakly flattened proximally and weakly curving. MALE GENITALIA: Not dissected.

ETYMOLOGY: Named for its elongate, necklike pronotum; from the Latin *prolixus*, stretched out, long.

HOSTS: Unknown.

DISTRIBUTION: Philippine Islands: Leyte and Negros.

PARATYPE: ♀, PHILIPPINE ISLANDS: Negros Isl.: 1300 ft, Camp Lookout, Dumagutete, Feb. 15–April 15, 1961, T. Schneirla and A. Reyes (AMNH).

TAXA INCERTAE SEDIS

Durthmarus tibialis Linnavuori

Druthmarus tibialis Linnavuori, 1975: 55 (n. sp.).

DISCUSSION: Linnavuori (1975) described *Druthmarus tibialis* as new from the Sudan. He related this taxon to *Druthmarus congolensis* Carvalho (1951: 104) and following Carvalho, placed it in the Orthotylini; based on the genitalic illustrations of Linnavuori this is clearly the correct subfamily and tribal placement for *tibialis*. Schuh (1984) placed *Druthmarus magnicornis* Distant, the type of the genus, in the Pilophorini. Thus, at least *tibialis*, and almost certainly *congolensis*, are not congeneric with *magnicornis*. They will probably need to be placed in a new genus, but that is a problem beyond the scope of this paper. See also discussion in Schuh (1984: 33).

Pilophorus minutissimus Linnavuori

Pilophorus minutissimus Linnavuori, 1975: 59 (n. sp.).

DISCUSSION: Linnavuori (1975) indicated that this species could be "Easily recognized by the size and the absence of the transverse band of silvery tomentum on corium." I have examined several specimens of *minutissimus*, including Linnavuori material from the Sudan as well as two specimens from South Africa. The species is very small and delicate and most of specimens are females and/or in poor condition. It appears that the parempodia are of setiform structure, a feature found elsewhere in the Pilophorini only in *Pilophorus samoanus* Knight. The male genitalia of one specimen which was dissected by Linnavuori indicate that the left paramere is typical of the type found in most Phylini (and some Pilophorini) and that the vesica—although somewhat difficult to interpret—appears not to have a developed secondary gonopore and in general appears similar to that of species currently placed in *Sthenaridea*. Contrary to what was indicated by Linnavuori, there are sericeous scalelike setae (tomentum) on the dorsum, but examination with a scanning electron microscope will be required to determine if these setae are of the same structure as those found in species placed in the Pilophorini. The setae are arranged as follows: a narrow band across the entire width of the body on the hemelytra and scutellum just posterior to the pronotum; as four patches on the corium adjacent to the claval suture; and as a few setae on the anterior margin of the cuneus. It appears that there are no scalelike setae on either the thoracic pleuron or the abdominal venter, placements which occur in nearly all species of *Pilophorus*.

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